Space Weather Forecast

Issued on Saturday, 20 July 2024 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Isolated Moderate class flares likely. Chance of G1 Minor Storms day 1 and day 4 (20 & 23 Jul).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity through the last 24 hours with three Moderate-class flares observed. Peak flare was at 19/1806 UTC from a large region near south-centre disk. There are fifteen sunspot regions on the disc. The largest and most complex region is the aforementioned culprit of the moderate class flare. It has seen some shrinkage and the magnetic complexity is showing signs of decreasing. A moderately sized spot is closely positioned to the larger spot, and although reasonable simple, it exhibits large magnetic looping between the two regions. The only other region of note is AR3759 in the southwest, now with intermediate spot development. Two new simple mature and stable regions are apparent near the southeastern limb, and a couple spots have faded to pores or plage near the western limb.

Two filament eruptions were observed off the south-centre late on 19 Jul, with subsequent coronal mass ejections. The second of which from the more northerly eruption may have an Earth-directed component, with an arrival at Earth early 23 Jul most probable.

Solar Wind / Geomagnetic Activity: Slow wind conditions largely persisted, with minor perturbations and very small discontinuities, these indicative of weak transients. The solar wind speed was at background. Interplanetary magnetic field (IMF) was mostly Weak, but became briefly Moderate between 20/0815-1000 UTC. The north-south component was largely positive. Geomagnetic activity was Quiet throughout (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate with further Moderate-class flares likely and a slight chance of Strong-class flares, mainly from the large region near south centre disk, however, given the number of sunspots isolated flares are possible from across the disc.

Solar Wind /Geomagnetic Activity: Two potential weak coronal mass ejection arrivals may occur on day 1 (20 Jul). A further coronal mass ejection has the potential to arrive early day 4 (23 Jul). The large coronal hole in the northwest is not expected to have any significant influence. Consequently, aside from the potential coronal mass ejection arrivals day 1 and day 4 (20 and 23 Jul), background slow wind conditions are expected.

Geomagnetic activity is expected to be mostly Quiet to Unsettled, but with a chance of Active to G1 Minor Storm intervals day 1 and day 4 (20 and 23 Jul) due to coronal mass ejection effects. A slight chance is maintained days 2 and 3 (21 and 22 Jul) should any late or early coronal mass ejection arrivals occur.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is likely to remain at background with no solar radiation storms expected. However, any notable flares will bring the potential for this to rise, with a slight chance of reaching the S1 Minor

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Met Office Space Weather Forecast

Solar Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	10	10	40
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.